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Goltsos

(54) **OPTICALLY-BASED SYSTEM FOR PROCESSING BANKNOTES BASED ON SECURITY FEATURE EMISSIONS**

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(21) Appl. No.: **10/091,207**

(22) Filed: **Mar. 4, 2002**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/498,116, filed on Feb. 4, 2000, now Pat. No. 6,384,920, which is a continuation of application No. 09/197,650, filed on Nov. 23, 1998, now Pat. No. 6,064,476.

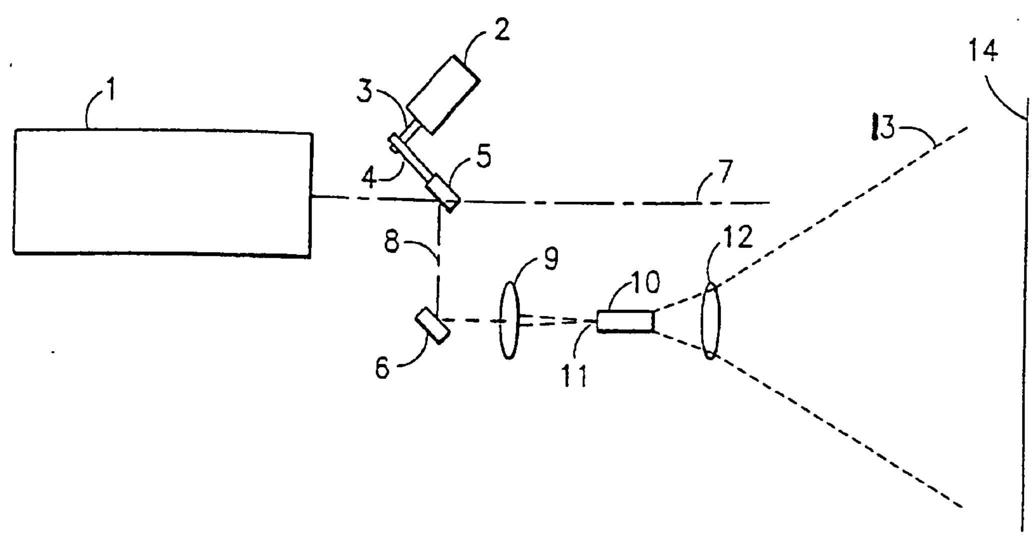
(60) Provisional application No. 60/066,837, filed on Nov. 25, 1997.

Publication Classification

(51) **Int. Cl.**^{7} **G01B 11/24**
(52) **U.S. Cl.** **356/601**

(57) **ABSTRACT**

A method and a system are disclosed for processing a banknote. The method includes providing a banknote having at least one photonically active security feature, the banknote being moved along a conveyance path; illuminating the at least one security feature with light from a stimulus source; identifying a location of the at least one security feature by detecting an emission from the security feature; directing an excitation source at the identified location; illuminating the at least security feature with light from the excitation source; and detecting a further emission from the photonically active security feature in response to the light from the excitation source. The step of identifying may include operating a linescan camera having scan axis that is parallel to a conveyance axis, or a scan axis that is perpendicular to the conveyance axis. The step of identifying may also include operating a single element detector to accumulate a line scan along the banknote at a same cross-axis location as a field of view of the excitation source. In one embodiment the step of directing includes delaying operation of the excitation source for a period of time that is a function of at least a speed of conveyance, and a distance between a illumination points of the stimulus source and the excitation source. The photonically active security feature can include at least one thread or planchette or other structure, such as a tape, having a substrate material and an electromagnetic radiation emitting and amplifying material for providing a laser-like emission. The structure can be embedded within or disposed on the banknote. The detected further emission may be an optical code for identifying at least one characteristic of the banknote.



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(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0030815 A1**

Ichijo (43) **Pub. Date: Mar. 14, 2002**

(54) **LIGHT SCATTERING TYPE PARTICLE DETECTOR**

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(21) Appl. No.: **09/852,964**

(22) Filed: **May 10, 2001**

(30) **Foreign Application Priority Data**

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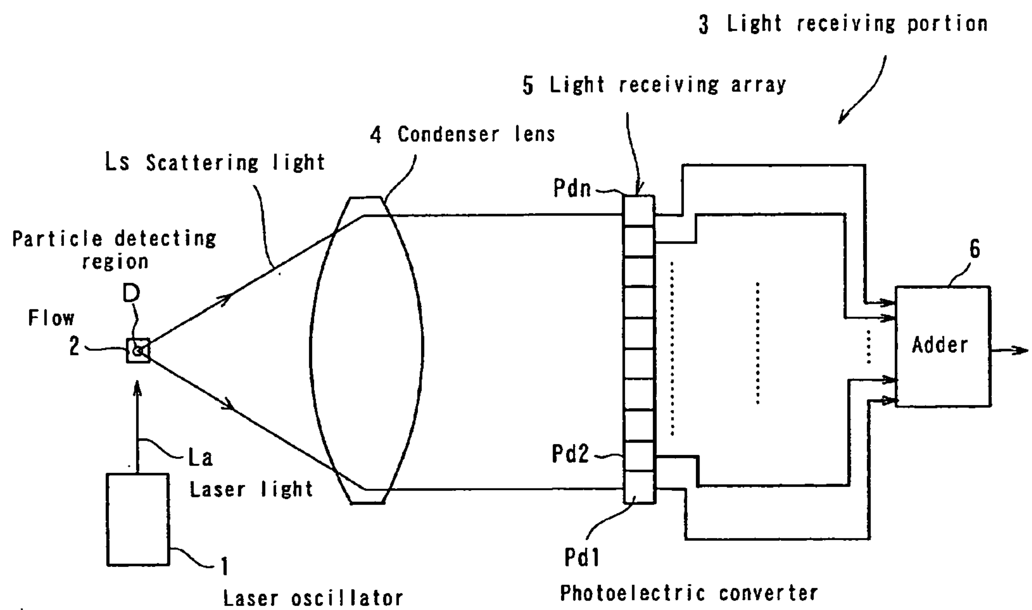
Publication Classification

(51) **Int. Cl.⁷** **G01N 21/00**
(52) **U.S. Cl.** **356/339**

(57) **ABSTRACT**

According to the present invention, there is provided a light scattering type particle detector in which the S/N ratio is improved. In the light scattering type particle detector, a particle detecting region D is formed by irradiating laser light La on sample fluid and scattering light Ls due to particles which pass through the particle detecting region D is received with the light receiving array **5**. The light receiving array **5** is formed to be circular by arranging a plurality of photoelectric converters Pd1-Pdn in a plane alignment. The adder **6** adds the output from the plurality of the photoelectric converters Pd1-Pdn.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2001/0035954 A1**

Rahn et al. (43) **Pub. Date: Nov. 1, 2001**

(54) **METHOD AND APPARATUS FOR MEASURING PARTICLE SIZE DISTRIBUTIONS USING LIGHT SCATTERING**

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(21) Appl. No.: **09/803,494**

(22) Filed: **Mar. 10, 2001**

Related U.S. Application Data

(63) Non-provisional of provisional application No. 60/188,278, filed on Mar. 10, 2000.

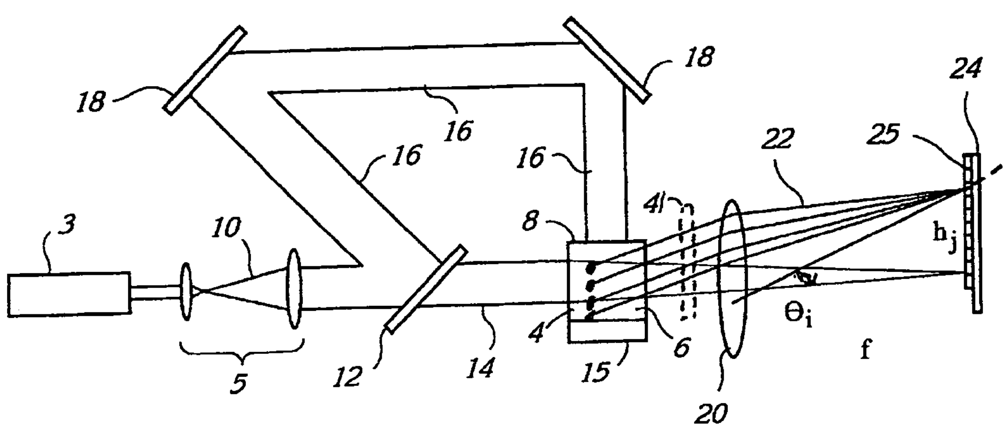
Publication Classification

(51) **Int. Cl.**^{7} **G01N 15/02**

(52) **U.S. Cl.** **356/336**

(57) **ABSTRACT**

Methods and apparatus for measuring the spatial distribution of light scattered by particles passing through the intersecting volume of two light beams, directed at right angles to each other. The sample cell design permits light to enter at right angles, making it possible to examine both low-angle and wide-angle scattering. A Fourier optical system directs a portion of the scattered light onto an array consisting of multiple photodetectors. The light impinging on the array consists of light scattered from both light beams. A computer program allows the instrument user to specify various groupings of the data values generated by the photodetectors to create a smaller number of data channels for analysis. Different grouping configurations can be generated from the same set of data values. A degaussing coil encircles a portion of the flow path to aid in dispersing magnetized particles. A device for obtaining the diameter distributions of high-aspect ratio particles (fibers) is described.



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(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0159060 A1**
Roques et al. (43) **Pub. Date: Oct. 31, 2002**

(54) **DEVICE FOR DETERMINING THE VALUES OF AT LEAST ONE PARAMETER OF PARTICLES, IN PARTICULAR WATER DROPLETS**

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(21) Appl. No.: **09/979,886**

(22) PCT Filed: **Mar. 21, 2001**

(86) PCT No.: **PCT/FR01/00842**

(30) **Foreign Application Priority Data**

Apr. 7, 2000 (FR) 00/04432

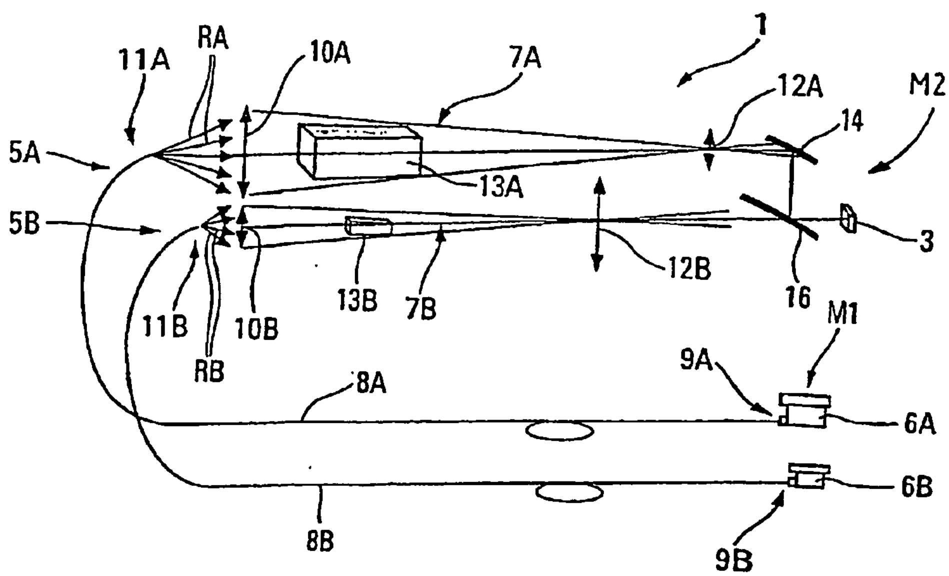
Publication Classification

(51) **Int. Cl.**^{7} **G01N 15/02**
(52) **U.S. Cl.** **356/335**

(57) **ABSTRACT**

A device for determining the values of at least one parameter of particles, especially of water droplets.

The device (1) comprises a measuring element (2) comprising a measuring region (ZM) which is intended to accommodate the particles, illumination means (M1) capable of illuminating the measuring region (ZM) by means of a light beam (7B), image acquisition means comprising at least one camera (3) capable of acquiring at least one image of the measuring region (ZM) illuminated by said illumination means (M1), and processing means (4) capable of determining the values of the parameter, from the image acquired by the camera (3). The illumination means (M1) are constituted so as to produce point illumination, using a light beam (7B), the light rays of which are focused on an objective optic (12B) of the image acquisition means.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0154295 A1**

Ivakhnenko et al. (43) **Pub. Date: Oct. 24, 2002**

(54) **METHOD AND APPARATUS FOR CLASSIFYING DEFECTS OCCURRING AT OR NEAR A SURFACE OF A SMOOTH SUBSTRATE**

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(73) Assignee: **ADE Corporation**, Westwood, MA (US)

(21) Appl. No.: **09/804,218**

(22) Filed: **Mar. 12, 2001**

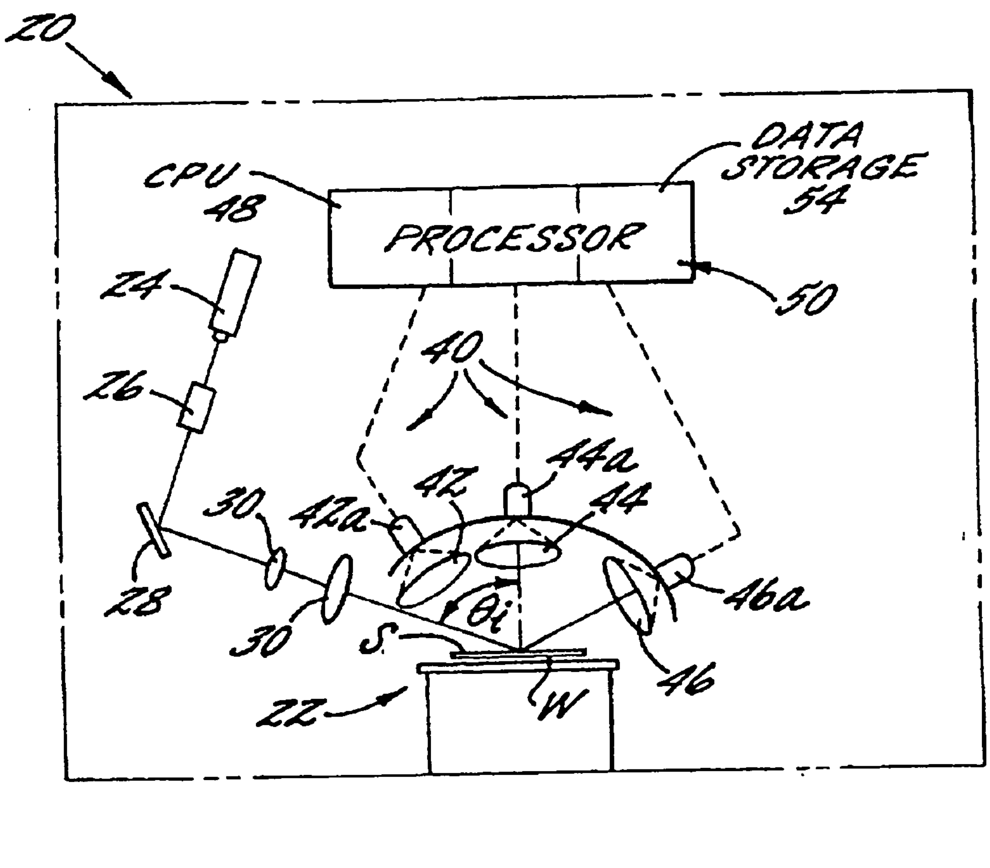
Publication Classification

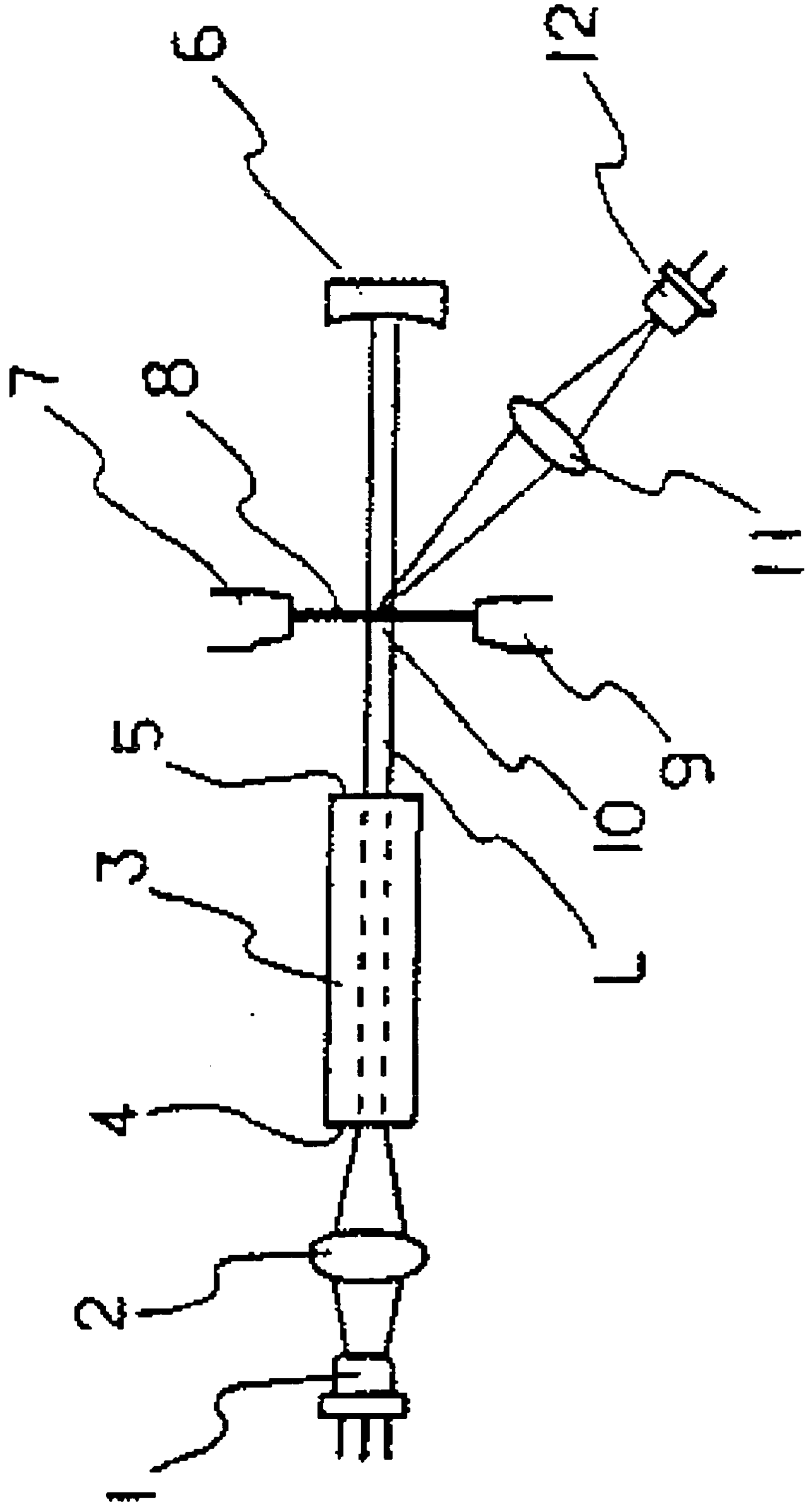
(51) **Int. Cl.**[7] **G01N 21/88**

(52) **U.S. Cl.** **356/237.2**

(57) **ABSTRACT**

In an optical inspection system, defects such as particles, pits, subsurface voids, mounds, or other defects occurring at or near the smooth surface of a substrate are classified by type and size based on the magnitude S of a signal produced by collected light for each of a plurality N of different test configurations, yielding a plurality of signal magnitudes S_1 through S_N. A database is consulted, comprising a relationship of S versus defect size d for each test configuration and for each of a plurality of idealized defect types, so as to determine a defect size d corresponding to each measured signal magnitude S, and an average defect size is determined for each defect type. Signal magnitudes $\langle S_1 \rangle$ through $\langle S_N \rangle$ that would be produced by a defect of the average size are determined for each defect type, and defect type is determined based on a smallest deviation between the measured magnitudes and the determined magnitudes.

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